

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**  
(PCT Article 36 and Rule 70)

|   |  |  |
|---|--|--|
| Applicant's or agent's file reference<br>FP18541  | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416). |  |
| International Application No.<br><b>PCT/AU2003/001319</b>   | International Filing Date<br>(day/month/year)<br>8 October 2003  | Priority Date (day/month/year)<br>8 October 2002 |
| International Patent Classification (IPC) or national classification and IPC<br>Int. Cl. <sup>7</sup> C23C 2/00, 2/12, 2/40 |  |  |
| Applicant<br>BHP STEEL LIMITED et al  |  |  |

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| 1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.  |
| 2. This REPORT consists of a total of 3 sheets, including this cover sheet.<br><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).<br>These annexes consist of a total of sheet(s).   |
| 3. This report contains indications relating to the following items:<br>I <input checked="" type="checkbox"/> Basis of the report<br>II <input type="checkbox"/> Priority<br>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability<br>IV <input type="checkbox"/> Lack of unity of invention<br>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement<br>VI <input type="checkbox"/> Certain documents cited<br>VII <input type="checkbox"/> Certain defects in the international application<br>VIII <input type="checkbox"/> Certain observations on the international application |

|   |  |
|---|--|
| Date of submission of the demand<br>7 May 2004  | Date of completion of the report<br>7 December 2004                      |
| Name and mailing address of the IPEA/AU<br>AUSTRALIAN PATENT OFFICE<br>PO BOX 200, WODEN ACT 2606, AUSTRALIA<br>E-mail address: pct@ipaustalia.gov.au<br>Facsimile No. (02) 6285 3929 | Authorized Officer<br><br>MR KIM WELLENS<br>Telephone No. (02) 6283 2162 |

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU2003/001319

**I. Basis of the report****1. With regard to the elements of the international application:\***

- ☒ the international application as originally filed.
- ☐ the description, pages , as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the claims, pages , as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the drawings, pages , as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

**4. ☐ The amendments have resulted in the cancellation of:**

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/AU2003/001319

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

|                               |              |     |
|-------------------------------|--------------|-----|
| Novelty (N)                   | Claims 1- 10 | YES |
|                               | Claims       | NO  |
| Inventive step (IS)           | Claims 1- 10 | YES |
|                               | Claims       | NO  |
| Industrial applicability (IA) | Claims 1- 10 | YES |
|                               | Claims       | NO  |

2. Citations and explanations (Rule 70.7)

D1- US 6284062 B1 (Nagashima et al.), 4 September 2001

D2- Derwent Abstract Accession No. 2001-545192/61, Class M13, JP 2001207247 A (Nippon Steel Corp.), 31 July 2001

D3- Derwent Abstract Accession No. 2000-233273/20, Class M13, JP 2000054095 A (Tocalo Co Ltd), 22 February 2000

D4- Derwent Abstract Accession No. 2000-019709/02, Class M13, JP 11294478 A (NTN Corp), 26 October 1999

Novelty (N) and Inventive Step (IS) claims 1- 10

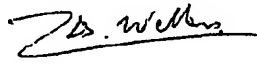
The invention relates to a hot dip coating apparatus for coating a steel strip in a Al- Zn alloy bath, wherein the components (in particular the sink roll) are made from stainless steel, with an appreciable amount of nitrogen substantially distributed uniformly through the microstructure of the stainless steel. This arrangement has been shown to improve corrosion resistance and minimises pitting of the component.

D1 is considered the closest document. This document also relates to reducing the corrosion of components such as sink rolls in a hot dip coating apparatus by nitriding the stainless steel. However the component is formed as a layered structure. Amongst other disadvantages, such a component has inferior corrosion resistance to that of a component having nitrogen uniformly distributed through the microstructure of the stainless steel.

Consequently claims 1- 10 are novel and involve an inventive step

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU03/01319

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|--|--|--|--|---|---|--|---|--|--|---|--|--|
| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>   |  |  |  |   |   |  |   |  |  |   |  |  |
| Int. Cl. <sup>7</sup> : C23C 2/00, 2/12, 2/40  |  |  |  |   |   |  |   |  |  |   |  |  |
| According to International Patent Classification (IPC) or to both national classification and IPC  |  |  |  |   |   |  |   |  |  |   |  |  |
| <b>B. FIELDS SEARCHED</b>  |  |  |  |   |   |  |   |  |  |   |  |  |
| Minimum documentation searched (classification system followed by classification symbols)<br>IPC C23C 2/00, 2/12, 2/40; IPC C23C 1/00, 1/08 AS INDICATED BY ELECTRONIC DATABASE  |  |  |  |   |   |  |   |  |  |   |  |  |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched<br>-   |  |  |  |   |   |  |   |  |  |   |  |  |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)<br>DWPI: IPC as above with key words aluminium, aluminum, nitrogen, nitride   |  |  |  |   |   |  |   |  |  |   |  |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>  |  |  |  |   |   |  |   |  |  |   |  |  |
| Category*  | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.  |  |   |   |  |   |  |  |   |  |  |
| X  | US 6284062 B1 (Nagashima et al.), 4 September 2001<br>Whole document   | 1- 10  |  |   |   |  |   |  |  |   |  |  |
| A  | Derwent Abstract Accession No. 2001-545192/61, Class M13, JP 2001207247 A (Nippon Steel Corp.), 31 July 2001<br>Abstract   | 1- 10  |  |   |   |  |   |  |  |   |  |  |
| A  | Derwent Abstract Accession No. 2000-233273/20, Class M13, JP 2000054095 A (Tocalo Co Ltd), 22 February 2000<br>Abstract  | 1- 10  |  |   |   |  |   |  |  |   |  |  |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex  |  |  |  |   |   |  |   |  |  |   |  |  |
| <p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&amp;" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table> |  |  | "A" document defining the general state of the art which is not considered to be of particular relevance | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention | "E" earlier application or patent but published on or after the international filing date | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone | "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art | "O" document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family | "P" document published prior to the international filing date but later than the priority date claimed |  |
| "A" document defining the general state of the art which is not considered to be of particular relevance   | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  |  |  |   |   |  |   |  |  |   |  |  |
| "E" earlier application or patent but published on or after the international filing date  | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone   |  |  |   |   |  |   |  |  |   |  |  |
| "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |  |  |   |   |  |   |  |  |   |  |  |
| "O" document referring to an oral disclosure, use, exhibition or other means   | "&" document member of the same patent family  |  |  |   |   |  |   |  |  |   |  |  |
| "P" document published prior to the international filing date but later than the priority date claimed   |  |  |  |   |   |  |   |  |  |   |  |  |
| Date of the actual completion of the international search<br>23 October 2003   |  | Date of mailing of the international search report<br>31 OCT 2003  |  |   |   |  |   |  |  |   |  |  |
| Name and mailing address of the ISA/AU<br>AUSTRALIAN PATENT OFFICE<br>PO BOX 200, WODEN ACT 2606, AUSTRALIA<br>E-mail address: pct@ipaustalia.gov.au<br>Facsimile No. (02) 6285 3929   |  | Authorized officer<br><br>MR KIM WELLENS<br>Telephone No : (02) 6283 2162 |  |   |   |  |   |  |  |   |  |  |

**INTERNATIONAL SEARCH REPORT**

International application No.  
**PCT/AU03/01319**

**C (Continuation).****DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                              | Relevant to claim No. |
|-----------|---|-----------------------|
| A         | Derwent Abstract Accession No. 2000-019709/02, Class M13, JP 11294478 A (NTN Corp), 26 October 1999<br>Abstract | 1- 10                 |

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU03/01319

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document Cited in<br>Search Report |            |    | Patent Family Member |              |
|---|------------|----|----------------------|--------------|
| US  | 6284062    | AU | 59529/98             | JP 10265923  |
| JP  | 2001207247 |    | NONE                 |              |
| JP  | 2000054095 |    | NONE                 |              |
| JP  | 11294478   |    | NONE                 |              |
|   |            |    |                      | END OF ANNEX |